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In Memory

of

Charles Baskerville

Teacher, Friend and Gentleman

Former Head of the Department
of Chemistry

University of North Carolina

Courtesy of Chemical and Metallurgical Engineering

DR. CHARLES BASKERVILLE

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-- EDITORIAL --

Charles Baskerville

The passing of Dr. Charles Baskerville, eminent chemist and Head of the Department of Chemistry of the College of the City of New York, brings deep sorrow to the chemical world, and many institutions, societies, and friends mourn his death.

The University is proud to claim among her list of distinguished sons the name of Charles Baskerville. As student, athlete, and professor he was well known in the life of the University, and when he left this campus the memories of old days spent here were ever dear to his heart.

"He was personally one of the most charming men I have ever known," says Dr. Chas. Mangum in speaking of his life at the University. "He was physically a splendid man—brilliant, cultured, always smiling, good-natured, and friendly. Naturally a man of this type took a very prominent part in all social affairs. His home was a social center."

His was a life of service, dedicated to great tasks and problems, the solution of which have contributed greatly to the welfare of mankind. In all of his work there is that mark of service to his fellow-man. He proved his skill as a research chemist in his work on anaesthetics and he gave to the world a wealth of information that is of inestimable value.

Dr. Baskerville died in his fifty-second year. Death claimed him in the midst of a fruitful life. Had he been permitted to continue his labors, no doubt the scientific world could have looked forward to many more achievements from him. But the memories of his noble life are still with us and we may still be guided by them.

From Third to Home

We are running the last lap of the race. We are but a few steps away from home plate. In a few short days we tag the final station and, with the umpire's decision, our undergraduate days are over.

It was but yesterday when we entered the University as timid, innocent Freshmen. Today we look forward to the short while which intervenes before our last set of examinations. Then commencement, with the coveted sheepskin, and all is over.

Tomorrow we launch out into the deep—each one his own helmsman—with a heavy sea and a treacherous ship to steer. We entered here as rough stones, fresh from the quarry. Today we stand hewn from the sculptor's hand—but not yet a part of the building. The rest of it is for us. Just what part of the building we will become and just how important that part is to be depends upon "Just we ourselves." We are not yet chemists in the full sense of the word; only the foundation has been laid, and the structure is far from complete.

The question that now looms large is: "What will we do with this, our foundation?" And it is one that each must solve for himself. Surely after four years spent here we cannot afford to abuse it. Surely we will not use it unwisely.

What Kind of Alumnus Will You Be?

Very soon we will enter the cold and merciless world of the outside. We are soon to get a taste of life—"life in the raw," as it has been termed. The four years spent here have been glad and happy years. They have been tinged no doubt—as all years are tinged—with bits of remorse. But after all—even after days of "colossal" and "dire black" ignorance—they have been years of growth and outlook, which bring happiness.

As we near the time when we can call ourselves alumni, each should determine for himself just what kind of

alumnus he will be. There are many things that the Department expects of you after you leave. Let us be specific. Naturally you want to see your Department grow, then it will be your duty to inform those with whom you come in contact, who are considering the study of chemistry, of the standing of this Department. No one can be more influential along this line than those who have completed the course here.

Again, we can help to make a bigger library, by contributing and by arousing the interest of other alumni in its growth.

Finally, we should keep in touch with the Department and give notice of any change of address. These things may seem small in a sense but they will count for much with concerted action, and they will go far toward building a stronger Department.

THE BROADER VIEW

By Stroud Jordan, Ph. D., '09

["Another very prevalent popular opinion of a chemist is that he is a peculiar cross between a fool and a genius and must be tolerated, in the hopes that some day he may inadvertently mention an idea which the 'practical' men of the plant may be able to translate into dollars." This is the narrow view. Read "The Broader View."—The Editor.]

It has been said, and rightfully, that the past war was a chemical one. It can also be said just as truly, that the age in which we are living is a chemical one. If one doubts this statement let him look around and count up the many industries which are depending wholly or in part on well defined chemical phenomena. Much of our food-stuff is dependent, directly or indirectly, on the production of sulfuric acid which is itself made by a well known chemical process. The growth of plants necessary for human consumption requires the aid of fertilizers, which in turn require the use of chemically prepared sulfuric acid in their preparation. And so we might go on and on, piling up example after example, but it is only necessary to say that if chemical processes which are now in general use, should all be shut off today, we would revert back to the stone age or perhaps further.

It is not necessarily a fact that because one has studied chemistry he dedicates himself to a life of test-tube gazing, although this is oftentimes a popular misconception of his real place in the universe. Such misconceptions impede progress and until we can get the general public more conversant with the actual meaning and application of chemistry we are not going to advance as rapidly as we should. Another very prevalent popular opinion of a chemist is that he is a peculiar cross between a fool and a genius and must be tolerated, in the hopes that some day he may inadvertently mention an idea which the "pratical" men of the plant may be able to translate into dollars. It is folly to combat such misconceptions for to do so will only aggravate; but rather should the World be educated so that the offering of a chemist may be received and utilized for the greatest possible advancement.

Look around you now and see the need for a greater knowledge of chemistry in all walks of life which are generally assumed to have no such need. Watch the average trial lawyer with years of experience, trying to handle a case whose nature is essentially chemical, and watch the youngster with a general knowledge of chemistry make a monkey out of him. Can a man successfully defend or prosecute a case, the nature of which he does not understand? The average physician laughed at the idea of studying chemistry while in college and did just enough work on it to pass the course. Ask him now what he thinks of the need of chemistry in his work. You might get further

along if you could ask the pharmacist who filled some of his earlier prescriptions.

The architect says that chemistry can have little bearing on his work, but how about the steel used in his girders? How about the cement used in his building? And then his two worst enemies, rust and decay, are chemical phenomena and must be combatted by chemical means. The average business man thinks that chemistry is a thing apart from his existence but if he is successful and climbs the ladder he may be called upon to direct the affairs of some corporation whose products require chemical supervision. Is he fitted to direct such work?

The farmer thinks that his time is better spent judging cattle or learning to terrace his hillsides, but if he doesn't have the food for his cattle he needn't judge them and if he can't produce profitably, his terraces are useless. He must buy chemical fertilizers and sprays to successfully raise and protect his crops, and unless he knows what he is buying he is very likely to get buncoed in the game.

A careful survey of other walks of life will point out just as many direct or indirect needs for chemical training as have been mentioned, and many more. The Manager of any business surely can translate his Auditor's report, his Superintendent's report, and his Salesman's report into dollars, and dollars mean dividends. How many Managers, requiring the service of a chemist, can translate his reports into practical application and subsequently into dollars.

In every-day life there is no subject of more import and yet has as little attention as chemistry. Let's show the World where it is needed and that those of us who have been chemically trained are perhaps as good business men as those trained along other lines. Let's show the several professions and lines of business that they are to blame more than the chemist for impeding progress, in as much as they are not conversant enough with chemistry to utilize it to advantage in their work. But first let's be convinced that when we prepared ourselves as chemist we did not hand-cuff ourselves for life, but rather that we have in our power a weapon which makes us better fitted for business than one who has been less fortunate in his training. Let's become far-sighted and do the things which appear most expedient, whether they be purely chemical or of another nature, for after all it matters little whether chemistry is directly or indirectly responsible for our personal welfare so long as we do an honest day's work for an honest day's pay.

HELIUM

By Dr. Richard B. Moore

Chief Chemist, United States Bureau of Mines

During the solar eclipse of 1868, Janssen first used the spectroscope in connection with such observations. A bright yellow line was observed in the spectrum of the chromosphere, which is an envelope of incandescent gases surrounding the sun. Since this line did not exactly coincide with the D1 and D2 lines of sodium, it was called the D3 line. Afterward Lockyer and Franklin showed that the line did not belong to any terrestrial element and proposed the name "Helium" for the unknown element which gave rise to the D3 line.

No further work was done in connection with this observation until 1894.

Sir William Ramsay and Lord Rayleigh had shortly before announced the discovery of argon and Ramsay was looking for sources of argon other than the atmosphere in which it exists in the proportion of 1 part to 104 parts of air. Sir Henry Miers called his attention to the fact that Dr. W. F. Hillebrand, now Chief Chemist of the Bureau of Standards and at that time in the Geo-

logical Survey, had obtained a gas which he supposed to be entirely nitrogen, from certain minerals containing uranium. Ramsay obtained a sample of one of these minerals—cleveite—heated it with sulphuric acid, purified the gas from oxygen, nitrogen, carbon dioxide, etc., and ran the residual gas into a spectrum tube. The spectrum showed the bright yellow line which had been observed by Janssen in the chromosphere and the measurement of its wave length by Crookes proved that the lines were identical.

Ramsay, Kayser and Friedlander afterward showed that helium existed in the atmosphere. Ramsay, during his work on argon, had prepared about 11 liters of argon which he was saving for fractionation purposes. This gas was liquefied and the first faction that came off was examined spectroscopically. It not only showed the D3 line in the spectrum of helium, but it also showed a large number of very bright red and orange lines which belonged to a new element which he called neon. Ramsay's original measurements indicated that helium existed in the air in the proportion of 1 part of helium to 250,000 parts of air, but more recent measurements by Watson give 1 part in 185,000 by volume.

Helium is found in the gases from many springs, notably those at Bois, France; Raillière in the Pyrenees; Maxières, Côte d'Or; and at the Bath Springs in England. In some cases the amount of helium present is as much as 5 per cent. by volume.

It also exists in minerals carrying either uranium or thorium, due to the disintegration of the radio-active elements present with the elimination of alpha particles, which are charged helium atoms. Rutherford predicted without any direct experimental evidence that the radio-active alpha particle was a helium atom. The proof of this was obtained by Ramsay and Soddy, who showed that the radium emanation changed to helium by actually allowing some radium emanation obtained from radium to stand for a number of days in a tiny spectrum tube, in which the spectrum of helium gradually developed. Some few minerals contain helium which are not radio-active, or in which the radio-active material is negligible, such as rutile and zircon. It is also found in some of the Stasfurt minerals such as sylvine, which is crystallized potassium chloride, and carnollite, a crystalline double chloride of potassium and magnesium. Some rock salt samples also contain traces of helium. Various explanations have been offered for this apparent anomaly, but none of them seems to be satisfactory.

In 1907 Cady and MacFarland found that a number of natural gases in Kansas, especially around Dexter and Eureka, contained notable quantities of helium some of them carrying as much as 1½ per cent of helium by volume.

In 1915 it came to the attention of the Bureau of Mines that the British were greatly interested in the possibility of using helium in dirigibles for war purposes. This was due to the fact that helium is not inflammable and is the only gas which is light enough to take the place of hydrogen, since pure helium has 92 per cent of the lifting power of hydrogen. The fact that it is not inflammable gives it a tremendous advantage over hydrogen for war purposes. A few days after we entered the war the Bureau of Mines took the matter up, the Army and Navy Departments became interested, furnished the money, and the result was that three experimental plants were built in Texas in connection with the Petrolia natural gas supply, which carries .93 per cent by volume of helium. Two plants were located at Fort Worth, using the Linde process and the Claude process (air reduction process), respectively. A third plant, using the Jeffries-Norton process, was placed at Petrolia, Texas, where the natural gas wells are located.

Shortly before the armistice was signed, the Linde plant had obtained the best results and it was decided to build a large production plant using the Linde Process. Since that time the two experimental plants at Fort Worth have

been dismantled in order to make way for the large production plant which is rapidly nearing completion. The plant at Petrolia, using the Jeffries-Norton process, started after the other two and is still in the experimental stage, and the work there is being developed with the idea that this plant may ultimately produce helium more cheaply than any of the other processes. The production plant will have an approximate capacity of five million cubic feet of natural gas per day. Before the war helium cost about $2,000 a cubic foot; it is estimated by the Navy, which has charge of the construction of the production plant, that the operating cost of the helium from this plant will be a little over 5½ cents a cubic foot.

As already stated, the main advantage in connection with the use of helium in dirigibles lies in the fact that it does not burn. Most of the dirigibles destroyed during the war were brought down by incendiary bullets from airplanes. An airplane would have no chance whatever in destroying a helium dirigible, as incendiary bullets would be just as harmless as ordinary bullets. Puncture of the gas cells by bullets would result only in a small leakage of gas. On the other hand, an airplane attacking a helium dirigible would have a hard time, as such a dirigible could concentrate on the airplane the fire from 8 to 12 machine guns, and, under such circumstances, an airplane would likely flee from a helium dirigible rather than attack it. When it came to a fight a helium dirigible would easily put out of commission a hydrogen dirigible, the relative efficiency bearing something of the same relation as an ironclad to a wooden ship.

The use of dirigibles in wartime is mainly along two lines, that of acting as scouts and for bombing purposes. The first is the more important, but great damage could be done to an enemy where an airship could descend low enough with safety to be sure of making direct hits, as would be the case with ships filled with helium.

As there is no danger from fire, it will be possible to put the engines practically in the framework or immediately below, and in this manner get a more direct drive from the engines and a higher speed.

As a ship with a capacity of three million cubic feet costs to build somewhere around 80 cents to 90 cents a cubic foot capacity, it can readily be seen that helium at 5½ cents per cubic foot is a valuable asset from the insurance standpoint alone.

There are still many problems to be worked out in the actual construction of the airships themselves in order to get the highest effiiciency from the new gas. It will probably be at least a couple of years, or even longer, before the first helium-filled dirigible crosses the Atlantic, but when this event takes place it will be an epoch-making one, not only in connection with aeronautics, but also in connection with the whole science of warfare.

During the late war the German fleet never left Kiel Harbor, nor any of the other ports, without being attended by several hydrogen-filled dirigibles. These airships acted as scouts for the German Navy, and were able to apprise it not only of the approach of the British fleet but also of the type of vessels and the strength of the fleet. The Germans were then able to decide at their leisure whether they would or would not accept battle. One or two helium dirigibles would have put out of commission the whole German air fleet and would have left the German Navy without its "eyes." Such a condition would have undoubtedly resulted in the ultimate capture or destruction of the German fleet during the war and would have had a very material effect on the final result.

The Helium Board consisting of representatives of the Army and Navy, with the Bureau of Mines co-operating, has investigated all sources of supply of helium in this country. Helium-bearing gas is found not only at Petrolia, Texas, but also at a number of places in Okla-

homa, particularly in the Osage district, in southeastern Kansas, in northern Montana, in Vinton County, Ohio, and in other localities. It is estimated that at the present time as much as five hundred thousand cubic feet per day of helium is going into our atmosphere from these fields. It is the desire of the Government to make a complete survey of the country, so as to know just what our resources of this extremely valuable gas are.

Outside of the United States there are only two localities in the whole world which appear at the present time to have any commercial importance as a source of this gas. It is estimated that about ten million cubic feet of helium per annum could be produced from the Canadian natural gas which supplies the town of Calgary. In Italy there are some steam vents in Tuscany, which are commonly called suffioni, that carry helium. This source might supply as much as ten million cubic feet of helium per annum to the Italians. The gas at Calgary is low grade, carrying only about .3 of a per cent helium, but the helium could undoubtedly be obtained without great difficulty from the suffioni. These two sources of supply, while interesting and important, are small in comparison with the known sources we have in this country. America at the present time, therefore, is paramount as a source of commercial helium.

It is difficult to state just what will take place in connection with the private commercial development of this gas for transportation purposes. It is strongly advisable that the gas shall not be exported from this country, as it could be sold to and stored by nations with whom we might some day have a combat and we would thus lose the very material benefit and advantage which we have at the present time.

THE ELISHA MITCHELL SCIENTIFIC SOCIETY—HISTORICAL SKETCH, GROWTH AND DEVELOPMENT

By Dr. F. P. Venable

[This article is one which has long been wanted. There are many who know little or nothing of the origin of The Elisha Mitchell Scientific Society. The part it has played in the development of the scientific life of the University is beyond estimate.—The Editor.]

Shortly after the opening of the session in 1883 five young professors in the University, constituting the scientific faculty, met and decided to establish a society for the furtherance of their work. These five, Gore, Graves, Holmes, Phillips, and Venable, had the spirit of adventure and the audacity of youth and entered upon an undertaking where older men might well have hesitated. Their avowed purpose was to hold monthly meetings and to publish an annual journal containing the results of their own scientific work and that of their students. Thus the society would serve as an inspiration to their students, interest and widen the horizon of the community and, if possible, develop a spirit of scientific inquiry in the State. Their fondest hopes have been more than realized.

In searching for a name they concluded to use that of one of the former members of the faculty, Elisha Mitchell, who while not a distinguished man of science had faithfully made use of such opportunities as were at hand. He had met a tragic death on Mt. Mitchell which he had discovered and measured, finding it to be the highest peak east of the Rockies. He lost his life while exploring this mountain and his body lies buried on its summit.

The cost of publishing the Journal was met by a small membership fee and a number of friends and alumni of the University thus joined in its support. After some years the society was aided by a small appropriation from the University and eventually the cost of publication was taken over by it in consideration of holding title to its rapidly

growing library which now has a value of many thousands of dollars. The first issue of the Journal appeared in 1884 and contained 97 pages. Sixty-seven papers were presented in the first seven meetings of that year, the strictly technical ones being read by title only. Twenty of these papers represented the contributions of the students. In its fourth year it became a semi-annual publication with 181 pages and had an exchange list of twenty-five in foreign countries and thirty-six in the United States. In one more year these exchanges had grown to 205 of which 75 came from 14 foreign countries. Later the list grew to more than 300 coming from over twenty-five nationalities. In 1904 with volume XX the Journal became a quarterly. Thirty-seven volumes in all have appeared with 5460 pages and some hundreds of plates and illustrations.

Some years ago the Journal took over the publication of papers presented before the North Carolina Academy of Science, toward the founding of which the Society had given no small impetus. Up to that time the contributed papers had come exclusively from the University. It should be stated also that after the first dozen years of the Society's existence it had been found advisable to publish the more important and lengthier investigations coming from the scientific departments in the various specialized Journals of the country so as to reach a larger number of interested readers and such papers were not reprinted in the Journal.

It may be fairly claimed that such activity shown by a comparatively small institution was rather remarkable. The Society had well justified its existence and more than fulfilled the hopes of its founders, only one of whom is now living. Outside of the scientific departments this influence has also been shown in the establishment of specialized societies in the University and the issuance of Journals which have taken a high mark. Such, for instance, are the Historical Monographs and the Journal of the Philological Club.

The meetings of the Society were at first and for many years thereafter, of a popular nature following up the original plan of arousing a general interest in Science—its problems and achievements. On account of the growth of the University and its increased specialization these meetings have of late years been devoted to the presentation and discussion of more technical or abstruse subjects and the attendance has continued to be most gratifying. The last meeting in May, 1922, was the 258th in the history of the Society. It is a far cry back to the beginnings of the Society but that which was begun in faith and hope has played a part in the development of the University, the value and meaning of which is beyond estimate.

THE CHEMISTS' PAYMASTER

By D. H. Killeffer, B. S., '15

[Here we have an article which should interest chemists and teachers of chemistry as well. The writer treats his subject from an economic standpoint and makes some points which are worthy of your consideration.—The Editor.]

The prime essential for any man, whether he be a chemist or a street cleaner, is a close, intimate, and comfortable relation with his paymaster. In other words, he must be able to gauge his own value accurately and convince others of that value, whether it be high, low, or medium. It is in this particular that many chemists fail to live up to their possibilities through lack of any definite basis on which to figure their worth. Their paymaster, the chemical industry, is a hard-headed, close-fisted business, and is always looking for results. Nothing else really counts in business but results. Years of service mean nothing when compared to results, and it is the fair gauging of

results into terms of value that enables man to get just what he deserves in business.

Chemical students are very much inclined to the belief that if they can acquire as thorough a knowledge of chemistry as possible, they will not need anything else. Nothing could be farther from the truth! The chemist is given training, much against his will at times, in physics, electricity, geology, mathematics, languages, and what not, but seldom, if ever, is it even suggested that a study of the economics of his industry would be a real help to him! The relation of money to his industry and his industry to money seldom troubles the chemist when he knows where his next check is coming from, and after years of hard work on a costly failure he suddenly wakes up one day to the fact that his otherwise faultless chemistry has failed of success because he has neglected to study the economic aspects of the problem in hand.

A case in point is that of the mechanic who spent all he had perfecting a machine for the manufacture of blank finger rings. A jeweler suggested to him that the present process for the manufacture of gold rings was very tedious and slow and required the services of expert goldsmiths. The jeweler had heard of the marvelous things accomplished by machines for making cigarettes, matches, and so on, all more complicated than the shaping of rings, and had become enthused over the idea that his mechanical friend could make them both rich by building a machine to turn out quantities of gold rings. His enthusiasm was easily passed on to the mechanic, who labored many months perfecting a machine which would consume gold tubes and turn out rings all ready for the setting. Finally the machine was finished, a masterpiece of mechanical design, and was ready to turn out rings for the world. The capacity of the machine was ten perfect rings a second, six hundred a minute, thirty-six thousand an hour. The machine had cost thousands of dollars and was a marvel of efficiency, but—and this is where the inventor failed—if the machine made all the rings required by the entire world it would only need to operate three days a year!

Of course, it is possible to find people who have the kind of economic training that is needed to avoid such blunders, but there are very few such who are in close touch with the problems of the chemical industry. The industry, as it is ordinarily termed, is not a definite thing in itself, but is a matter of many industries, one might almost say all industries, in its scope. Its requirements are peculiar and its methods of operation different from those of any other industry.

In a broad sense, the industry needs men who are trained both in chemistry and economics, but necessarily the number of specialized experts of this kind that can be used is limited. In a personal sense, the increased value to the industry, as well as to himself, of a chemist with an economic point of view is worthy of serious consideration by our technical schools and by the chemists themselves. Every study that a chemist makes begins to be valuable to the world in general only when translated from his terms of molecules, atoms and symbols into the commercial terms of pounds, tons and money. The value of a technical man to his employer depends directly on the establishment of mutual understanding in some terms or other, and it is self-evident that the business man cannot and will not understand the chemists' point of view until it is translated into the terms which he understands. Your boss can hardly be expected to study chemistry for the sole purpose of understanding you better. Of course, the converse has been true, too, that a chemist would not study economics for the sole purpose of understanding his boss, and that has resulted directly in manifold laments about poor pay in the chemical journals. The chemists do not know what they are worth and no one else is sufficiently interested to find out for them!

The means of accomplishing this familiarity with the economics of things

chemical are at present very limited. The only sources of such information are a few technical journals dealing with this aspect of chemistry in a very practical way, but often too close to the subject to give the student the necessary perspective. The service they render the industry is unquestionable, but there certainly should be some means of teaching things of this kind to the student, so that he will not need to enter the primary class in the University of Hard Knocks. It is a thought worthy of careful consideration by teachers, students and chemists, generally.

THE FELLOWSHIP SYSTEM OF INDUSTRIAL RESEARCH, MELLON INSTITUTE OF INDUSTRIAL RESEARCH

By C. B. Carter, Ph. D., '16

[Mr. Carter received his Ph.D. degree from this University in 1916. He has been connected with Mellon Institute since the summer of that year where he has held Fellowships of both individual and multiple types.—The Editor.]

The Fellowship System of Industrial Research which is in successful operation at the present time in the Mellon Institute of Industrial Research at Pittsburgh, Pa., was established at the University of Kansas in 1907 by the late Robert Kennedy Duncan. The idea of the Fellowship System was conceived by Dr. Duncan while attending the Sixth International Congress of Applied Chemistry at Rome in 1906. Dr. Duncan had been impressed, while gathering material for his two books, "The New Knowledge" and "The Chemistry of Commerce," by the very extensive and mutually helpful co-operation which he found to exist between industrial organizations and scientific institutions in certain countries of Europe, notably Italy and Germany. He knew the lack of such a system of co-operation in America. He says in an address in 1911: "The American factories, taking them by and large, and making such distinguished exceptions as could be numbered on the fingers of both hands, certainly do not have co-ordinating relations with the Universities, such, for example, as we find developed in Germany. Furthermore, in so far as industrial research is concerned, they do not have co-ordinating relations with one another. There exists no common consciousness among the corporation officials of this country of the proper methods of conducting factory research." It was these observa-

C. B. CARTER
Fellow, Mellon Institute

tions that gave rise to the Fellowship idea.

Returning to America to accept the chair of industrial chemistry in the University of Kansas, Dr. Duncan at once set about testing the idea. The fundamental principles of the system were, and still are for that matter, unique and apart from the beaten trail. The installation of the system, therefore, was of necessity modest and purely experimental in character. A brief fifteen years have elapsed since that modest beginning, but during this brief period a phenomenal crystalline growth has taken form about that nucleus and today the Mellon Institute occupies a place of eminence in the field of applied science.

The keynote of the Fellowship System is co-operation. Any manufacturer, group of manufacturers, or corporation, having technical problems requiring solution, may have these problems investigated under the Fellowship System by entering into a co-operative agreement with the Mellon Institute. The agreement takes the form of a contract. The manufacturer agrees to contribute a definite sum of money to cover the cost of carrying on the investigation for a period of at least one year, and thereby become the Donor of a Fellowship. The money thus contributed is used to pay the salary of the research man who carries out the investigation and to cover, in part, the cost of materials and apparatus necessary for the prosecution of the work. In addition to contributing this sum of money, the manufacturer also agrees to cooperate with the Mellon Institute in every possible legitimate way. The Mellon Institute, in turn, agrees to supply every modern convenience for the proper execution of scientific research and to intrust the investigations to research men of suitable qualifications. Any and all discoveries, improvements, and inventions made in the course of the investigations become the sole property of the Donor.

The foundation fund of a Fellowship is not fixed and invariable. It must be obvious that the sum of money paid in by the Donor is dependent upon the nature and scope of the problems involved and the number of research men required to carry them out. It follows, therefore, that a problem requiring the time and efforts of five or six or more men necessitates a larger foundation fund than one involving the time and efforts of one or two men.

The Fellowship having been thus founded, the Director of the Mellon Institute selects one or more research chemists, as the case may require, either from the available men within the Institute laboratories or from without. In either event the men selected are chosen with special regard to their qualifications for handling the problem involved. The men thus selected are called Industrial Fellows. It is stipulated that the entire time of these Fellows with the exception of three hours a week which, if required, may be devoted to instructional work in the University of Pittsburgh, shall be devoted to the prosecution of the investigation assigned to them.

It will be clear from what has been said in the preceding paragraphs that the manufacturer's interests are amply safeguarded at all times. He is assured that his money is being spent wisely by men who have been trained in the best methods of scientific research. He becomes sole owner of any and all discoveries, improvements, and inventions resulting from the investigations. He knows that his problems are being attacked by competent men in an institution whose one specialty is Industrial Research. And in addition to this he is enabled to obtain the scientific information that he requires at less cost than if the investigations were carried out in his own laboratory. Adequate library facilities alone would render the cost of real research prohibitive to many small manufacturers, the class of manufacturers frequently most in need of the researcher's assistance to enable them to compete with the larger companies and corporations.

So much for the system as it reflects upon the manufacturer. It reflects

equally advantageously upon the Fellow. He lives constantly in a research atmosphere; all about him is research. He is supplied with or has funds to buy all necessary materials and apparatus, and, best of all, indispensable library facilities are available. The distractions and annoyances of the factory laboratory and its routine are foreign to him. Yet, thanks to the co-operative features of the system, the doors of the Donor's factory are open to him, for the Donor agrees to co-operate with him at all times, even to the extent of divulging the most treasured of his plant secrets, if such be necessary to the success of the work in hand.

Having seen how the system is founded upon principle of co-operation, we may turn now and see what constitutes a fellowship from the standpoint of its personnel. The Fellowships are of two types, the single and the multiple, and the type is determinable by the number of Fellows engaged in a given investigation. In the single Fellowship type the problem involved is of such a character as to require the efforts of one research Fellow and one or more assistants. In the mutiple type the scope of the investigation is broader, requiring the time and attention of two or more Fellows and one or more assistants. In the latter type the Fellows are given different ratings; one Fellow, known as the Senior Fellow, has entire charge of the investigation and is responsible to the Administrative Staff, the other members, known as Junior Fellows, being in turn responsible to the Senior Fellow.

The investigations as carried out in the laboratories of the Mellon Institute are not essentially different from similar investigations as conducted in any other well organized industrial research laboratory. They are different, however, in that they cover a multiplicity of subjects. The Fellow on assuming the duties of a new Fellowship at once sets about familiarizing himself with the field into which the new problem naturally falls. This frequently, though not always, involves an extensive search into the literature, with particular regard for patent literature. Then, if the problem is intimately related to plant practice, he may find it necessary to spend a considerable time in the Donor's factory studying the processes which are there in operation.

The information obtained during this more or less comprehensive study of the problem is correlated and a tentative method of attack is formulated. The experimental work is then carried out along these lines and if the laboratory experiments ultimately are of a character to justify the expenditures, the Donor contributes sufficient money to permit of trying out the experiments on a semi-commercial scale. The product, if a new product is involved, is manufactured in quantities large enough to demonstrate the practicability of the process. If these experiments are amenable they may be carried out in the factory; otherwise they are performed in small unit plants which are erected on the grounds of the Mellon Institute for the purpose. The investigation now has been carried as far as it can be taken in the Institute and is ready to be tried out on a commercial scale.

As stated earlier in these pages the Fellowship System was established in a purely experimental way at the University of Kansas in 1907. In 1911 Dr. Duncan was called to Pittsburgh, Pa., to establish the system in the department of industrial chemistry at the University of Pittsburgh. A temporary building was erected at a cost of about ten thousand dollars and this building housed the activities of the system until 1913, when Messrs. A. W. and R. B. Mellon, bankers of Pittsburgh, through a gift of more than five hundred thousand dollars established it on a permanent basis. The system is functioning at the present time in a modern building which was completed in 1915 at a cost of three hundred and fifty thousand dollars. This building contains executive and clerical offices, the reference library, machine shop, refrigerating plant, thirty-eight research laboratories, and several special laboratories for elec-

tric furnace, dark-room and precision work.

The administrative staff of the Mellon Institute, at the present time, consists of a Director, an Associate Director, and three Assistant Directors. The staff supervises the investigations, selects the Industrial Fellows, determines their salaries, and otherwise attends to the various administrative affairs of the Institute.

A complete list of the Fellowships in operation at the present time is not at hand. There are, however, some forty to fifty different lines of investigation in various stages of development, requiring the services of eighty or more Industrial Fellows and several student assistants. These investigations include problems in synthetic resins, bread, illuminating glass, soap, food containers, synthetic acids, protected metals, sulphur, oil shales, corrosion, oil, gas, emulsion flavors, inks, perfumes, yeast, magnesia products, fertilizers, and a score of others. A glance at even a partial list of these Institute activities convinces one that the Industrial Fellowship System has proven its worth; that it is here to stay.

CHEMISTRY AND LOGIC

By Prof. Horace Williams

Chemistry offers one of the rich fields to the student of logic. He sees it this way. Galileo put the theories of Copernicus to work. With his experiments and his telescope he showed that nature was life. Not only was nature alive; this life was orderly. Kepler and Newton carried the thought to completion, showing a genuine world, illustrating law and running under its own steam. Nature was complete in itself. This view competed with Scholasticism, challenging it point by point. Two world-views were in collision. It was a master struggle.

Nature being a genuine world, intelligible and running under its own steam made a deep appeal to young men. The situation was well adapted to the qualities of youth. The field was wide, new and rich in promise. The atmosphere was free.

Chemistry is the first result. It gave fundamental results to the student of logic.

1—The method was analytical. Take a specimen of nature and open it and see for yourself how it is made and what are its parts. This direct approach to the object to be studied has been applied to all subjects of study and led to rich results.

2—The analytical method bringing us face-to-face with the object gave an astonishing result. The analysis showed that the thing was not what it appeared to be. Anything analysed into something else. Scholasticism had a system of perfect forms, not to be changed. Water is not water, but H_2O. This was a fundamental contribution to knowledge. Knowledge is not a revelation of the finished, but a product of relatedness.

3—Not only does one thing analyze into another. This applies to quality and quantity. Aristotle had taught that quality is that which belongs to a thing in and for itself. Scholasticism had accepted this as a revelation. Chemistry showed that quality passes into quantity and quantity into quality. This has been a difficult lesson for logic to appropriate. Logic loves to consider quality as divine, as fixed. It is fond of claiming this as the foundation of knowledge.

4—The fourth contribution made by chemistry to logic is the discovery of measure in nature. You may have a hundred parts of hydrogen and a thousand parts of oxygen, all there and ready to be taken. But exactly two parts of hydrogen will unite with one

part of oxygen. All the others are left every time. The chemist finds this measure wherever he studies.

This discovery of chemistry is of utmost value to the logician. We call it a standard, an authority, a law. It abolishes caprice, arbitrariness, fiats-of-will from nature.

These four are the fundamental contributions of chemistry to logic.

A NEW SITUATION

By Dr. A. S. Wheeler

Before the great war Americans took hold of many industries involving organic compounds very slowly. A few like the mineral oil, photographic, soap and leather industries were fairly well developed and a limited number of compounds of carbon were therefore manufactured in this country. But Europeans remained far ahead of us in many industries, including the manufacture of synthetic dyes which employ so extensively the products obtained in the burning of coal. Coal is burned to obtain illuminating gas, coke and other products and for direct heating purposes. In the United States, before the war, coal was burned for coke production chiefly in what are called "bee-hive" ovens, in which nearly forty per cent of the products of combustion passed off into the air and were lost. A few "by-product" coke ovens were however in use. In these, arrangements are made to save all gaseous and liquid by-products. After the war began these ovens multiplied rapidly, the reason being that the by-products were needed for the manufacture of explosives, dyes and medicines, the demand for these, of course, having increased enormously.

When coal is burned the products are gas, ammoniacal liquor, tar and coke. When the tar is heated by itself it yields very important liquids like benzene, toluene and xylene and solids such as naphthalene and anthracene. TNT, a remarkable explosive used in shells, is made from toluene, and picric acid, another explosive, is made from benzene. Naturally there was feverish haste to abandon the bee-hive ovens and construct by-product coke ovens. These same five by-products are the principal raw materials in the manufacture of aniline and other synthetic dyes. The United States was suddenly poverty stricken as to dyes when the war broke out, for Europeans had almost a monopoly in the making of synthetic dyes from coal tar by-products. Over one thousand such dyes were already known. The lack of dyes therefore caused an enormous demand for coal tar by-products. And lastly the war necessitated greatly increased supplies of medicines and antiseptics, and many of these are obtainable only from coal tar products.

The compounds of carbon outnumber the compounds of all the other seventy odd elements put together. Something like two hundred thousand compounds of carbon are now known. Many of these are of purely theoretical interest and are very rare indeed, but great numbers are of common every day importance. The mere enumeration of the industries based on such compounds is sufficient to show their importance: bone distillation, candle, dyes, essential oils and perfumes, explosives, glycerine, glue, illuminating gas, mineral, vegetable and animal oils, leather, paper, resins and gums, soap, starch and glucose, fermentation (achohol, vinegar and beverages), textile, wood distillation and photography; and this list is by no means complete. The growth of these industries in this country has created "a new situation" in the field of "Organic Chemistry" which concerns itself with the compounds of carbon. Before the war we looked to Europe for much of our supply and this meant many annoyances and delays, for three months were required to get any chemical from Germany. Today we have

some hope of becoming independent as indicated below. Germany has been the paradise of the chemist, for there the value of chemistry to civilization was appreciated. Men of the highest training in chemistry were eagerly sought by the manufacturer whereas in our own country business men were too often satisfied with half trained men who would work for two dollars a day. Some however knew better and employed men who had the Ph. D. degree and these have profited by their larger vision.

Research in the Universities and in the industries is essential to progress. There is no other way. Research concerns itself with the discovery of new principles and new compounds, and America is in a far better position in this respect than ever before. Rare as well as common raw materials must be obtainable for research work and in this direction the Eastman Kodak Company is doing great work. It is the first concern in the United States to manufacture a large number of organic compounds, and this has been done at a financial loss. The company knew this would be the case, at least for some years. The catalogue of the company contains over thirteen hundred carbon compounds and more are added to the list each month. Another service to the American chemist has been the publication by the National Research Council of a circular giving the names and addresses of the makers of a great many organic compounds. And now a new force has begun to make itself felt, the "Synthetic Organic Chemical Manufacturers Association of the United States" which proposes to establish a permanent organic chemical industry in the United States. This is a matter of immense importance both for peace and for preparedness for war. The President is Dr. Chas. H. Herty, former head of our Department of Chemistry.

THE CHEMIST OF THE FUTURE—SOME COMMENTS ABOUT THE SALARIED MAN

By Victor A. Coulter, Ph. D., '16
Assistant Professor of Chemistry, University of Mississippi

It is not the purpose of the writer to criticise adversely the viewpoint expressed in the article, "The Chemist of the Future" (The Carolina Chemist, Dec., 1921), for admittedly, running one's own business is much to be preferred to a salaried position. However, many students, having been in school all their lives, have not had an opportunity to learn of specific natural resources or manufacturing opportunities toward which they might direct their research while in school, and therefore can only look forward to getting a "job" when they leave school.

A chemist who has been in industrial work for some years remarked recently that the corporations seemed to regard chemists as a sort of "industrial parasites." It is quite true that "they may be 'fired' and another taken in to fill his place on short notice just as a bookkeeper or a clerk" in very many cases. Now there are lots of industrial chemist who are not "fired" indiscriminately during hard times, and it is into this group that a man entering the industrial field naturally wants to get.

Aside from the men of natural unusual brilliancy, who will succeed anywhere, those men who know reasonably well certain other lines in addition to laboratory manipulation and things purely chemical, usually stick. These other things that help the chemist working in a wide variety of industries are drafting, machine and furnace design, a general knowledge of electricity, care of machinery and repair work. To illustrate the necessity of this general engineering knowledge, let us suppose that a chemist has been given the problem of developing a process for some new product the company wishes to manufac-

ture. After he has worked it out in the laboratory, he must try it on a semi-commercial scale in apparatus of the same design and same materials which are to be used when the process is put on a commercial scale. In many cases this will require the designing of new equipment, or if not that, then the intelligent selection of the proper devices from those already manufactured. If it is mechanically operated equipment he must be able to see any weak points in the process and determine whether they are due to defective design or incorrect mechanical operation. If the motive power is electricity, he should know the performance characteristics and care of the various types of motors.

Then when he has developed a process in the laboratory, put it successfully through the semi-commercial stage, and it is being run on a commercial scale, he will probably go back to the laboratory to start on something else, but if he has not had to call on some one else for his general engineering design and operation, he is the one man that has the combined knowledge of both the mechanical and chemical sides of the process and therefore best fitted to straighten out difficulties that may arise later due, for instance, to variations in raw materials. Thus he tends to become one of the essential cogs in the factory organization, not likely to be discharged at the first appearance of hard times.

The "Chemist of the Future," now in college, will naturally ask how is he to acquire this information and at the same time learn sufficient chemistry. Much of it, drafting, machine design, and electricity come in prescribed courses, courses which should be taken just as seriously as the chemistry courses and not, as is frequently the case, regarded as necessary evils, to be passed because they are required for a degree. The practical mechanical experience may be gained in various ways, if a shop is available, by making things for himself, by working during summers in a machine shop, foundry or repair shop, and also by observing, whenever there is an opportunity, how a trained mechanical engineer or machinist does things.

In short, the student should strive to lay a foundation for as much skill in doing it on a laboratory scale, thereby putting himself in a position to make himself a necessity to his company.

HOW THE ALUMNI CAN HELP THE LIBRARY

The library fund, which has always been small and never adequate, has in reality decreased in value. Bindings have in many cases doubled in cost from the pre-war price. Likewise technical books are exceedingly high in price. Consequently when all the current periodicals, both foreign and domestic, have been paid for together with the cost of bindings, there is little left of the fund for the purchase of books or for other purposes for which it might be used.

How can an alumnus help the library? He can help in this way. Subscribe for some one of the periodicals for the library, say *Chemical Age*, *Chemical & Metallurgical Engineering*, or any other except the three journals of the American Chemical Society, which are already presented to the library each year by Wm. R. Kenan. *Chemical Age*, for example, is three dollars per year. The binding would cost perhaps three dollars more, or a total of six dollars for the bound volume. This of course seems a small item, but one must remember that when there are many subscriptions provided for in this way the sum total will loom large and more of the library fund can be used for the purchase of books which are sadly needed.

Then, too, a book presented occasionally to the library will help, and in a few years the collection may be considerably enlarged.

The name of the donor is stamped on inside cover of each volume presented.

Anyone who is interested in the growth of the library should write to Dr. J. M. Bell, Head of the Department of Chemistry.

DIRECTORY OF THE GRADUATES OF THE DEPARTMENT OF CHEMISTRY AND A FEW OTHERS WHO MADE AN EXTENSIVE STUDY OF CHEMISTRY WHILE IN THE UNIVERSITY.

The directory has been revised and brought up to date as far as possible. Names marked with an asterisk (*) are the last addresses available but from whom mail was returned unclaimed. Names with a cross (+) are those from whom mail was not returned but from whom no directory material was received. All other addresses are correct according to information received from them. Information concerning any name or address will be appreciated by THE CHEMIST.

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SIGMA XI LECTURE

Dr. F. W. Aston Lectures Before the North Carolina Chapter of the Society of the Sigma Xi

Dr. F. W. Aston, M.A., D.Sc., F.R.S., Fellow of Trinity College, Cambridge, England, delivered two lectures on Atomic Weights and Isotopes in Phillips Hall, March 30 and 31.

After lecturing to the Franklin Institute of Philadelphia, Dr. Aston visited several of the Universities of America, McGill, Harvard, Princeton, Johns Hopkins, and the Scientific societies of Washington. This University was fortunate in having Dr. Aston for two lectures, and in enjoying his genial society at numerous social gatherings. He was entertained by Drs. Bell, Pratt, Stuhlman and Saville. Golf was also possible on one day and the writer was unable to find out by how much Dr. Aston defeated one of the local golfers. It was a matter of keen disappointment that Dr. Aston failed to witness a baseball game—it would have been his first. It has never been settled whether Dr. Aston had the umpire or the Cheer leader in mind when he referred to the "star rooter" of the game.

The University should provide many more occasions of this kind, both for the scientific stimulus and also for the pleasant social intercourse with the leaders in science.

—J. M. B.

Potential energy is the energy due to the respect of one body for another.—*Freshman Quiz Book.*

"Do you serve lobsters here?"

"Yes, we serve anybody. Sit down, sir."—*Medley, Illinois Chemist.*

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THE HIGH SCHOOL DEPARTMENT

Temporarily, at least, we have abandoned the idea of awarding a medal to the High School student making the highest mark on an examination in Chemistry conducted by THE CAROLINA CHEMIST. We will continue to conduct the High School Department, for THE CHEMIST desires to be of the greatest possible service to High Schools.

We especially call your attention to the articles which are published in this column. "The Teaching of Chemistry in High Schools" should prove interesting and beneficial to teachers of Chemistry.

THE TEACHING OF CHEMISTRY IN HIGH SCHOOLS

By DR. F. P. VENABLE

Knowledge of chemistry does not consist in the number of facts known nor even in the orderly arrangement of the facts. The number of such known facts is enormous and constantly growing and no mortal brain can hold them all. Very little value may be attached to a partial and disjointed knowledge of them. Nor does it consist in an ability to use the shorthand of chemistry, the writing of formulas and the working out of equations. A stenographer with his symbols may be and often is a poor English scholar.

Chemistry became a science only after the great underlying laws were known and through them an explanation of the facts was obtained. A teacher of chemistry in the schools is of value only in so far as he is acquainted with those laws and can use them to make clear the meaning of the facts which he seeks to impress upon young, developing minds.

Again, mere cramming of facts leads to mental indigestion and often causes a distaste for science in general. Properly taught the eager, inquisitive minds will be attracted and gain those five adjuncts to self education, the methods of searching for truth, of co-ordinating facts, of finding the underlying causes of the phenomena of everyday life, and so understanding something of the marvels of the world in which we live. There is impressed also the absolute necessity for accuracy of observation and statement. If these be acquired then great is the profit however soon the road to their getting be forgotten.

For success in teaching in the schools there must be a gradual progression. Too abrupt a step is often fatal. It must be borne in mind that the pupil is entering a new field. Even the method of his teaching is somewhat novel and yet it can be shown that it is not altogether strange. Often it is just the old observation and experience in a new and what should be a far more interesting light. So far as possible the appeal should be constantly made to everyday experiences which heretofore have been accepted with little thought.

Take, for example, the burning of a candle as was done by Faraday in his celebrated lecture before the Royal Institution. So too, the chemistry of combustion in general may be taken up in its simpler forms, leading up to the combustion of food in the body. This would naturally bring up the nature of air and to a discussion of water. The products of combustion would include a study of carbon dioxide and the laws of the indestructibility of matter and fixity of proportion would find their place.

Along with such excursions in the field of investigations would come quite naturally some discussion of elements and compounds, of atoms and molecules, of combination and dissociation, of matter and energy. All these topics could be brought within the comprehension of

the junior high school pupil. Additional facts as to acids, bases and salts could readily be grasped.

This is sufficient to give some idea as to how the best foundations may be laid for the study of chemistry. The chief trouble that I foresee lies in securing the wise and capable teacher fitted to lead in such work. Little difficulty should be found in thus starting a pupil in the fascinating field of scientific study and inquiry.

WHAT THE CHEMICAL PROFESSION OFFERS YOU

By S. C. Smith

This article is not intended as propaganda for chemistry, for the profession of chemistry does not offer any greater opportunity to the average person than other professions. Perhaps not so much, except to those who love and enjoy scientific work. To them it offers a better opportunity than most any other profession.

There are two fields in chemistry which one may follow according to his inclination. First, there is research in which one seeks to find and substantiate some new truth, to discover new and useful substances, and to develop better processes for preparing substances already known. The latter involves industrial chemistry which is the the second field open to the chemist. Industrial development has gone hand in hand with chemical progress. The fine quality of steel which has made modern civilization possible was developed by research chemists. At the same time he has taken cotton and made it into artificial silk which appears and wears like real silk. There are thousands of such cases in which the chemist has multiplied many times the usefulness of the products of nature, but there are much greater things to be done in the future. Natural supplies are fast giving out and synthetic materials must take their place. To sum it up, the chemist has a two fold purpose to perform; first, to produce and to find uses for new substances, second, to replace natural products by cheaper synthetic products and to find new sources of materials and to develop them.

There is another phase of chemistry which makes an appeal to the student. There is always a touch of mystery to it. The spirit of alchemy clings yet to the profession and chemical work is always like playing a game.

DISCOVERED, A NEW SALT OF POTASSIUM!

Through the combined efforts of a large number of students, a new salt of potassium has been discovered and investigated. It is a rather simple conjugate compound and is easily formed.

If one part of potassium iodide is place with two parts of rhombic sulfur in the presence of the proper catalyst, they will react according to the equation:

KI+2S—KIS2, or KISS

The product is soluble in distilled moonlight and may be precipitated by the absence of humanity. The action is usually gentle and is greatly accelerated by some catalyst, as love. However, the reaction may become violent, so, for the sake of safety, the experiment is best carried on in the dark.

The salt has medicinal qualities, being used for aching lips, and as a heart balm. The frequency of application depends entirely upon the conditions.—*Illinois Chemist.*

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DEPARTMENT AND ALUMNI NOTES

The Department is the recipient, through the Charlotte office of the Du-Pont Company, of about sixty samples of American made dyes, together with a handsome book containing samples of different shades and colors of dyed fabrics.

A display case, with theoretical flow chart and process samples and illustrating the value of 85 per cent Magnesia as heat insulation, has recently been received by the Department.

The Department of Chemistry is taking over the work of testing fuels for the University. A *Paar* calorimeter has been secured as an aid in this work.

J. W. Turrentine, M.S., '02, is the author with H. G. Tanner, of the fifth article of a series, "The Applicability of Kelpchar as a Bleaching and Purifying Agent," which appeared in the January, 1922, issue of the *Journal of Industrial and Engineering Chemistry.*

Dr. Venable attended the spring meeting of the American Chemical Society, held in Birmingham. He made one of the principal addresses at this meeting and was entertained by a number of old Carolina men.

C. S. Venable, '14, is co-author, with C. D. Greene, of "Solubility of Sulphur in Rubber," an article which appeared in a recent issue of *The Journal of Industrial and Engineering Chemistry.*

"Zirconium and its Compounds," a book by Dr. F. P. Venable, has recently come from the press. It is published as one of the monographs issued under the auspices of the American Chemical Society.

Dr. A. S. Wheeler and his mother, Mrs. W. C. Wheeler of Tacoma, Wash., spent the Easter holidays in Florida.

Mr. H. D. Crockford was married to Miss Helen Delamar, of Raleigh, on January 21, 1922.

Dr. Bell spent the week, April 23-28, on business in Toronto, Canada. He stopped in Washington for a short while on his return.

L. Grier Marsh, '17, Assistant Explosives Chemist, Pittsburgh Experiment Station, U. S. Bureau of Mines, is the author of an article on "The Hygroscopicity of Picric Acid" which appeared in a recent issue of *The Journal of Industrial and Engineering Chemistry.*

LIGHT WANTED

Willie—"Mamma, when the fire goes out where does it go?"

Mrs. Gayboy—"I don't know. You might just as well ask me where your father goes when he goes out."—*New Bernian.*

HEAD, HE LOSES

Husband—"Where is my hat?"

Wife—"On the wringer, dear."

Husband—"What! On the wringer! I wonder what ridiculous thing I shall find it on next?"

Wife (sweetly)—"On your head, dear."—*New Bernian.*

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ALPHA CHI SIGMA

Since the last issue of THE CHEMIST, Rho chapter of Alpha Chi Sigma has added E. W. Constable, H. D. Crockford, and A. P. Sledd, graduates; J. A. Bender, C. K. Brooks, J. L. McEwen, and J. H. Mourane, Seniors; C. W. Flinton and G. M. Murphy, sophomores. The new chapter house, just back of the postoffice, is open at all times to alumni and friends of the members. And the house, by the way, is one which we will be proud to show to the old boys.

Dr. and Mrs. Bell have entertained students of the Department on three separate occasions during the past two months. Informal dinners were given respectively for the juniors, seniors, and graduate students. Such informal meetings tend to develop the "spirit of the Department" and they foster the bond of unity between professor and student which the campus seems to be striving for at this time. The hospitality of the host and hostess and the enjoyment of the evening will long be held as pleasant memories.

I have no faith in that proverb about all things coming to him who waits. My experience proves that the only things that come to the man who waits are the cast-off things of somebody else.—*John D. Rockefeller, Jr.*

A "future(?)" chemist—"Phenyl Isocyanide: the smell is sweetish and like onions."

FUN—CHEMICAL AND OTHERWISE

SOME QUESTIONS EDISON MIGHT ASK PURCHASING AGENTS

Are wire nails improved by manicuring?

Who was Mike Crometer?

Where do hexagon nuts grow?

What is the R.P.M. of a new bottle of hootch?

Who first "got down to brass tacks?" Which end was up?

Where do you buycarbonate?

Does refined iron ever lose its temper?

Who invented the cotton gin? Does it contain more than one-half of one per cent?

From what country did the Manganese emigrate?—A. A. W. in *Chemist Analyst.*

"I asked her if I could see her home."

"And what did she say?"

"She said she would send me a photo of it."—*Illinois Chemist.*

Jones—I have a new position, Chief.

Chief Chemist—Who are you working for now?

Jones—Why, I am Chemist for the City Base Ball Club.

Chief Chemist—Why should they need a Chemist?

Jones—To run bases.—*Chemist Analyst.*

Dr. Jones, superintendent of an insane asylum, was experimenting to find an acid that would dissolve any known substance. One morning he met Bill, one of the inmates of the asylum and he says: "Hello, Bill. I've perfected my acid."

"That's fine Doc; but what are you going to keep it in?"—*Dyestuffs.*

BE SPECIFIC

Doctor—"It's a boy, professor."

Absent-minded Professor (looking up from his work)—"What is?"—*New Bernian.*

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